FISHERIES DEPARTMENT

ANNUAL REPORT

UGANDA

1967

(1) General

The year 1967 could be regarded as one of considerable success judging by the achievements in the Fisheries Department. The total catch was 87,000 tons, worth approximately shs 62,000,000/- on the lake shore, and about shs 140,000,000/- in the retail markets. This compares favourably with 1966, when production reached a total of 82,000 tons, valued at shs 58,000,000/- on the lake shore, and shs 130,000,000/- in the retail markets. The consumption of fish showed a further increase during the year, and is now estimated at about 25 lbs. per head of population.

Catches from Lake Kyoga continued to rise, and have yet to show signs of decline. Fishermen in this Region have benefitted from demonstrations of fishing gear by Fisheries Department staff, and have equipped themselves with bigger mesh nets, which enabled them to catch larger Tilapia nilotica of up to 8 lbs. in weight.

In the Lake Edward/George Region, there was some marked increase in production of fish, particularly from Lake Edward.

In Lake Victoria there were various increases at fish landings. Nile Perch, which was stocked in the lake in 1962, were taken in increasing quantities of between 7 and 15 lbs. in weight. Tilapia nilotica have also been caught in greater numbers particularly in the Bukakata and Kagera River areas, and the using of larger mesh nets has encouraged greater increases in catches.

Fish farming has maintained its progress throughout the year, and experiments being carried out at Kajansi Experimental Station have greatly benefitted fish farming programmes with the increased production of Tilapia hybrids. Various studies were carried out on their feeding habits and growth rates, and these have thrown more light on the performance of hybrids in various fish ponds throughout the country.

The Department continued its investigations into Haplochromis stocks on Lake Victoria in conjunction with the staff of the East African Freshwater Fisheries Research Organisation at Jinja. The vessel "Darter", which had been re-fitted with modern equipDent, has proved to be most useful in these investigations, and results so far obtained would now seem to favourably reverse the previous theories on the stocks of Haplochromis, and also the possibility of establishing a Haplochromis

Experimental fishing on Lake Victoria revealed a wider spread of Nile Perch, and also large quantities of Tilapia nilotica, of weights up to $6\frac{1}{2}$ lbs.

The canning of Haplochromis continued, and several samples of tinned fish were sent to various laboratories for testing for quality and their marketing characteristics. Canning had to be discontinued before the end of the year, as results from the testing laboratories indicated various modifications to be effected.

In several places, particularly in Lake Kyoga Region, a number of brick smoke houses have been constructed! and the smoking of fish in these houses has been demonstrated to the fishermen. It is hoped that these will produce more hygienic products, and economise on fire-wood which is fast becoming scarce.

Several fishermen in the Lake Kyoga and Lake Albert Regions have availed themselves of the fishing boat subsidy schemos and have bought improved boats under this scheme.

(2) **Staff**

The staff of the Fisheries Department were strengthened by the recruitment of two ex-patriate Contract Fisheries Officers. One was posted to Lake Kyoga Region, and the other to Lake Albert Region. For the first time it was possible to recruit a Secretary on a permanent basis, which greatly assisted the work at Headquarters, though it was evident that more could be achieved with additional clerical staff at Headquarters. One Fisheries Officer returned from a course in Fisheries in the USA at the end of the year, and was due for posting in the field early in the New Year. Another Fisheries Officer was recruited, having finished a Degree course at the University of Washington, USA. An Assistant Fisheries Development Officer attended a Fisheries Co-operative Course in Canada, which lasted for six months. The Chief Fisheries Officer was a member of a delegation that attended the 14th Session of the FAO Conference in Rome, Italy, between October and November 1967. The Department received the services of a Canadian Master Fishermen, who demonstrated fishing gear techniques mainly on Lake Victoria. His assignment ended in September, 1967, but was expected to return the following year. An FAO Fish Culture expert worked with the Department for the whole year, on various experiments at Kajansi Experimental Station, and left for Yugoslavia in December 1967.

A large number of amendments to the Fish and Crocodiles Ordinance were carried out, which, in effect, removed tho powers of administration of the industry from District Commissioners, and invested them in the Minister of Animal Industry, Game and Fisheries, and the Chief Fisheries Officer. Therefore, for the first time, it became the responsibility of the Chief Fisheries Officer to licence all fishing vessels, and to issue all Specific or Special licences, as well as Crocodile Licenoes, and, therefore, have full powers over the industry, as well as being responsible for its development. Various sections of the Ordinance, which were thought to be out-dated, were brought up-to-date, and a number of definitions, which were somewhat ambiguous, were made clearer, and some new sections were addod to the Ordinance to allow for a more efficient running of the industry.

(4) Fisheries Training Institute

The construction of the Fisheries Training Institute was completed during the year, and the first batch of students took up residence during October. However, as furniture and other equipment had not arrived at that time, no formal courses could be started, but the period from October to November provided a very successful refresher course for many Fisheries Assistants, out of whom a final selection of students to take an up-grading course was made, and these were to start their course in January, 1968. The Principal of the Institute was appointed in Septeuber, 1967, and took up his duties immediately. In November, 1967, we reoeived. on socondment from the British Ministry of Overseas Development, the services of a Principal Advisor, who was to assist the Principal in the establishment and organisation of the Fisheries Training Institute.

(5) Fisheries by Regions

(a) Lake Ky0ga Region

The Region comprises a total cachement area of 22,000 square miles with approximately 880 square miles of fishable waters. The lake area is generally shallow, and much of the water is covered with floating papyrus and aquatic plants. The fishery of the Region maintained a remarkable rate of increase in production. Total production was estimated at 25,900 tons, as compared with 19,500 tons in 1966, or 32.8% increase. There was considerable change in the gear used. as fishermen equipped themselves with bigger mesh nets, suitable for

in weight, which fish are easier to handle, smoke and find ready markets. There were very outstanding increases in the tonnage of both these two introduced species. Nile Perch was estimated at 13,015 tons, as compared with 9,000 tons landed in 1966, while Ti1apia ni10tica produced 4,744 tons compared with a mere 191 tons landed in 1966. Tilapia variabilis shewed a considerable drop from 1968 tons landed in 1966, to 1,276 tons in 1967, while Tilapia esculenta showed only a slight increase from 650 tons in 1966, to 902 tons landed in 1967. Fluctuations in catches of Tilapia variabilis and Tilapia esculenta are difficult to explain without going into details of the gear used, the more so as there was a marked shift of effort to the bigger fish species such as Nile Perch and Tilapia nilotica. The success of the introduced fish aroused great interest, and investigations into their biology and ecology were initiated so as to throw more light on their future performance and management.

Long-lining still remains the method for taking larger Nile Perch and Protopterus? particularly in swampy areas. In the Victoria Nile, however, some fishermen have achieved greater success with trolling.

Although the dug-out canoes are slowly being replaced with planked canoes, these were generally badly constructed, flat-bottomed canoes, and because of the high prices, good boats could only be obtained with the assistance of a considerable subsidy.

Due to constant raids by the Karamajong into the Northern and Central Teso Districts, fishermen on Lake Salisbury were greatly disturbed, and most of them had to leave their camps, and Fisheries staff were vlithdrawn. Complete statistics, therefore, do not exist.

Experimental fishing by the Fisheries staff, however, showed that although Nile Perch have not been firmly established in this lake, fish of up to 30 Ibs. were available in the lake. In other, smaller lakes, enclosed by swamps, on the borders of Teso and Bukedi Districts, Nile Perch were indeed beginning to appear in the catches, particularly in the Kateta area. Elsewhere, the fishery was mainly based on Protopterus, Clarias, Tilapia nilotica. and Tilapia variabilis.

Very little work was done on the dams, mainly due to lack of funds and shortages in staff. The dams, therefore, remain badly managed and overgrown, with acquatic vegetation and floating grasses,

they are difficult to exploit. Similar conditions were revealed by a survey carried out on dams in Bukedi and Bugisu Districts.

Most landings did very well throughout the year, although it was noticed that there are still large movements of fishermen from one landing to another, particularly during the rainy seasons, when access to some of the landings was completely cut off. Lwampanga, with a total catch of 1,294 tons as against 642 tons in 1966, was the most successful. Here, also, fishermen equipped themselves with several Sese-type canoes, which are a great improvement on the flat-bottomed boats generally seen elsewhere on the lake.

Marketing of Fish: Due to difficulties in transportation, most of the catch was smoked before retailing; trade in fresh fish was limited to only a few landings with regular daily transport. The fish, however, found ready markets in Soroti, Mbale, Tororo, Jinja and other towns in the Northern region, while fresh fish was mainly carried from Lwampanga to Kampala, and from Bugondo to Kisumu.

(b) Lake Albert Region

Total production of fish from this Region was estimated at 12,981 tons, valued at shs 5,280,000/-, which shows little change from 1966.

Throughout the year, difficulties with Congo sales continued, and it is estimated that less than 1,000 tons of fish was exported to the Congo. Considerable sales to the Wamba area of Toro, and an increase in sales to West Nile off-set this lack of the Congo market.

There was a considerable improvement in the distribution net-work in West Nile, Gulu and Bunyoro, with many more fishmongers licenced, and this resulted in increased sales in those areas.

There was considerable difficulty with illegal fishing and crocodile poaching in the Semliki area, and the Department co-operated with law enforcement agencies in attempting to control these activities.

There was considerable development at Wanseko where the Department attempted to re-plan and re-organise the village. Agreement with the various authorities was reached, and a series of planned improvements in roads, etc., were put in hand with a bulldozer. Many sub-standard houses were demolished, and a grid of major roads laid out, whereupon

the local people. A new market place and fish stores were marked out, and construction commenced. The three major boat-building firms completed new and larger workshops in accordance with the new development plan.

The Department erected marking poles at the mouth of the Victoria Nile, which assisted fishermen in avoiding arrest or false accusations of fishing within the National Park. At Ntoroko, Departmental housing was completed, and the camp improved, but little was possible in the way of general village development, as priority was given to Wanseko. At Panyimur, considerable landings continued. General development was restricted, although private enterprises installed a series of major fish stores.

The regular ferry service between Wanseko and Panyimur continued throughout the year, and large quantities of fish were transported in this manner. Ferries were operated by Bugungu Ltd., which organisation expanded and developed its facilities, and became a major factor in the fishing industry.

Developments on the lake shore between Butiaba and Ntoroko were limited, although an Asian fish buyer, based at Butiaba, stimulated a certain amount of fishing at Tonya. Butiaba was the site of three major fish camps throughout most of the year, a development stimulated by the presence of the fish buyer.

Statistical records were maintained by the Department, and a programme of fish marketing investigation was commenced. The boat-builders in the Region had a rather difficult time, as subsidy payments were unduly delayed, but some 30 boats were completed during the year including two experimental canoes of impregnated hardwood. These boats were built by the Department, and then put to commercial fishing to thoroughly test the possibility of using this much cheaper material.

Departmental vehicles, launches, etc., functioned satisfactorily throughout the year, a considerable amount of work being carried out on the locally-built launch, "Tern", which was then used for a series of fishing experiments. These were concerned with deep-water fishing for Nile Perch, and some interesting results were obtained. The experiments were to be continued in 1968, with the eventual intention of publication in a scientific journal.

(c) Lakes Edward and George Region

over 1966 figures. Lake Edward showed an increase of 2,340 tons over 1966 catch, while there was a drop of 811 tons in catches from Lake George. This, however, may be only apparant as a substantial catch by poachers must have evaded the notice of the recording staff.

On Lake Edward, fishing was, in general, good, although fishermen experienced difficulties with Congolese fishermen who stole from them 24 canoes, 25 engines, and 1,000 nets. Rwensama and Kayanja, both close to the Congo border, suffered most. Violation of borders is still very common, usually resulting in loss of fishing boats and gear. The Congolese fishermen, however, are most difficult to handle by the Fisheries staff as they usually travel armed. Fishermen at Rwensama were as active as ever, and landed 3,000 tons of fish which was 916 tons higher than in 1966.

At Katwe, business was rather slack and many canoes were lying idle, while others operated from other landings, mainly Kazinga and Kishenyi. Two aprons and shelters were completed at Katwe to allow for a more hygienic handling of fish, and work started on a boat-building and repair shed.

Developments at Kishenyi were slow. Water cabbages became a serious problem and, at times, completely blocked access to the landing by canoes. This caused fishermen to land at other landings which was not beneficial to the development of Kishenyi. To combat this, the Department constructed a channel through the water cabbages, using expanded metal, cleared all the water cabbages in the channel and thus enabled the canoes to reach the mainland. This worked very satisfactorily for some time, until the expanded metal was damaged by hippos and the channel blocked again.

Kayinja and Kashaka landings on Lake George still remain very backward, mainly due to lack of access roads and this also allows the landings to conceal large numbers of poachers.

Poaching remained a menace on Lakes Edward and George, and in Lake George in particular, and poachers are adopting more complicated methods. Unfortunately, the launch "Eagle", was out of order for a lengthy period of time, which hindered anti-poaching activities in the Department. During the year, however, 134 illegal canoes were destroyed on Lake George, and 40 poop1G prosecuted for various offences under the Fish and Crocodiles Act.

Good catches were obtained from the minor lakes and dams in Ankole, but records are not complete, as the Fisheries Assistant in

charge of the area was incapacitated most of the time as a result of a motor accident, and no replacement staff was available. It is, however, estimated that production from the minor lakes was in the region of 3,600 tons, while dams in Ankole constituted another 100 tons.

Marketing of Fish: During the period under review, 350 itinerant fishmongers were issued with fishmongers' licences in the Districts of Ankole, Toro and Kigezi. These handled the distribution of fish, fresh and smoked, particularly to remote areas. In addition to these 173 specific licences were issued, and these mainly handled bulk quantities of fish to the big commercial centres like Kampala, Mbarara, Masaka and Kabale. Thore was great demand for fish, and this maintained high prices, for the fishermen. 248.5 tons of salted fish was exported to the Congo from this region. This quantity of salted fish was a by-product of the processing factories, since individual fishermen have completely abandoned this method of processinG due to non-availability of markets.

Fishing oxperiments were carried out at Saka, to establish the stocks of Tilapia in this lake, which is at an altitude, and where temperatures are, therofore, low. Rosults indicated that the Tilapia had established itself, although they did not grow to anything greater than $\frac{1}{2}$ lb. It was found that the growth of Nile Perch, also stocked in this lake, was extremoly slow. Nile Perch had not been able to breed at this height, and had, therefore, been most ineffective in tho control of the Tilapia populations which, in general, are considered to be stunted.

(d) Lake Victoria Region

Total production from the Uganda waters of Lake Victoria were estimated at a high figure of 37,579 tons in 1967, as against 27,400 tons in 1966, reflecting an increase of 10,079 tons of fish. While it is true that there was an intensification in the 0xploitation of the resources of this region, increased production is not believed to have been of the same order. It will be noticed from last year's report that methods of collection of statistics in this area were improved by the increase in number of Fisheries Assistants who covered a wider area than before. In 1967, this was further enchanced by carryinG out an aerial canoe count of the whole lake to ascertain the actual number of canoes actively participating in the fishery. The aerial survey was then followed by several checks on the ground to enable the Department to estimate the catCh/canoe data, which was used in estimating

the total catch from the lake. This, as will be noted, is a very conservative estimate, and works on tho basis of only 250 fishing days in a year, with a prod.uction of only 143 lbs. of fish per canoe per day. The survey revealed a total of 2,400 canoes actively participating in the industry, and that, on the average, each of these canoes was mannod by four people.

The Department continued its invGstigations into the Haplochromis stocks in conjunction with staff from EAFFRO at Jinja. The vessel, "Darter", recently r8-fitted under the supervision of a Canadian Master Fisherman, for the operation of trawling gear, proved most useful in these investigations, and results so far obtainod would now seem to favourably reverse the previous theories on Haplochromis stocks, and also the establishment of a Haplochromis canning industry on this lake.

Canning of Haplochromis continued alongside the population studies and several samples of tins were sent to various laboratories for testing for quality and other marketing characteristics. Reports received from the laboratorios that had been able to report, indicated that the product was good, and would bo acceptable in most markets, provided it was presented in the right type of tin and properly labelled. They also indicated some technical defects which they thought should be corrected. For this reason, canning had to be temporarily suspended until the cannery room was properly re-organised.

Experimental fishing by the Fisheries Department staff for Nile Perch showed a groater spread and more building up of the stocks in the various parts of the lake that were covered. Returns from commercial catches indicated that 11,520 Nile Perch were landed at the various landings, caught in all different types of gear, such as gill-nets, fence traps, hooks and seines. At Masese alone, 2,956 fish were landed. During these experiments, large quantities of Tilapia nilotica, of weights up to 6½ Ibs. were taken. Elsewhere, Tilapia nilotica were taken in increasing numbers in commercial catches, particularly at Bukakata, and in the Entebbe area which would seem to indicate that Tilapia nilotica are gradually becoming established in tho lake.

(6) Fish farming

(a) Kajansi Experimental Station

Work carried out on the impraements to the Experimental Station included the extension of the office block to orovide for a records and

statistics office , and a start was made on the lining of the feeder channels with concrete slabs to protect the channels from erosion. A poultry houses was constructed and completed at the farm to enable the raising of chickens for use in poultrY/fish farming experiments and fertilisation experiments with poultry droppings.

Mr. K. M. Apostolski, FAO Fisheries Biologist, worked at the Experimental Station for the whole year, evaluating the different types of feeds in the growth of Tilapia hybrids, and Carp, and in the field carried out an economic evaluation of fish culture in Uganda. A report on his work is still awaited.

Most of the experimental work at the Station centred on the evaluation of the different types of feeds, particularly the cheap ones like beer dregs and bran, and on the investigation into optimum densities under different conditions of feedin;, for both Tilapia hybrids and Carp. In other experiments, the efficiency of Bagrus docmac in controlling fish populations in ponds was being investigated. Bagrus docmac breeds more freely in ponds than Nile Perch, and since it is a very acceptable table fish it may prove to be a sensible choice for stocking in these ponds where it is desirable to control Tilapia populations.

It was possible, during the year, to achieve another successful spawning of Nile Perch in ponds, and 148 fingerlings of Nile Perch were obtained, and used in various experiments. The spawning was achieved in a newly-constructed pond where the water was relatively clear since not much silting had taken place.

Populaticns of Grass Carp (Ctenophoryngodon idella) and Giant Gourami (Osphronemus gourami) were maintained at the Experimental Station, but no spawning was obtained, nor were artificial breeding trials carried cut. Also under similar observations were Labeo victorianus, from which, similarly, no successful spawning has been obtained.

The Crayfish (Procambonus clerkii) continued to breed and spread allover the ponds at the Station. Its burrowing activities and ability to climb over fences, makes it difficult for it to be restricted to only a few ponds, and it was noted to interfere with the production of Tilapia hybrid fry, since it preyed on them.

(b) Mbale and Kigezi Regions

In the field, the collection of cropping statistics by the farmers

was still unsatisfactory, since many farmers do not keep such records. This, therefore, makes it difficult to know the actual tonnage of fish from these ponds. However, in those ponds which have been closely observed by Fisheries staff, production of up to 900 I'os. per acre for Carp and 735 Ibs. per acre for Ti1apia hybrids, have been obtained in Singo, Busiro, Kyagwe and Bugerere counties in Buganda, and 1,047 Ibs. per acre for Carp, and 300 lbs. per acre for Tilapia hybrids were obtained in Kigezi.

There was intensification of fish fry production at the Experimental Station, and at various fry centres in the country, to meet the great demand for fry. At Kyanamira and Kisizi, in Kigezi, ponds were fenccd to keep away frogs which preyed on the Carp eggs and fry, and at Kihihi the ponds were fenced to keep out poachers. With more refinement in the handling of Carp for breeding, and care of eggs and fry, it was possible at Kyanamira to obtain more than 10,000 fingerlings from one spawn.

TABLE I

ESTIMATED CATCH OF FISH LANDED IN VARIOUS DISTRICTS IN LAKE VICTORIA IN TONS

	Tilapia	Bagrus	Barbus	Mormyrus	Protopterus	C1arias	Labeo	A1estes	Hap1o-chromis	Schi1be	Synodon-tis	TOTAL
Bukedi	1938.0	378.6	88.2	72.2	433.3	325.0	40.1	28.1	184.6	4.0	20.1	4012.;
Busoga	4398.1	1994.2	200.5	164.0	983.4	737.6	91.1	63.8	419·0	9.1	45.5	9106.
East Mengo	1716.5	778.2	78.1	63.9	334.3	297.9	35.4	24.8	163.5	3.6	17.8	3554.'
West Mengo	2023.3	917.3	92.0	75.4	452.4	339.4	41.4	29.2	192.8	4.2	21.1	4188.,
Masaka	1979.0	1804.2	181.4	148.1	889.7	667.2	82.2	57.7	379.1	8.4	41.3	8238.
TOTAL	12054.9	6372.5	642.2	523.6	3143.1	**2367.1**	290.2	203.6	1339.0	29.3	145.8	29100.

ESTIMATED CATCH OF FISH LANDED IN THE ISLANDS IN TONS

East Mengo		2667.
Bukedi		2133.
Busoga		533.
Sesse Complex		4145.
		9473.
	GWIND TOTAL	38579.

TABLE II

TOTAL CATCH PER SPECIES AT VARIOUS LANDINGS ON LAKE EDWARD, LAKE GEORGE AND THE KAZINGA CHANNEL

LAKE EDWARD

Landing	Tilapia		Bagrus		Mormyrus		Barbus		Clarias		ProtopteruB		Labeo		Total tOlmagl
	No.	AV wt/ 1b.	No.	Av Wt/ lb.	No.	Av Wt/ bo	No.	Av Wt/ lb.	No.	Av Wt/ lb.	No.	;\v Wt/ Ibo	Noo	Av Wt/ 1b.	
Katwe	3,808,557	1.43	143,443	4.34	427	1.87	25,216	2072	8,927	4064	11,629	6003	637	1·99	
Kishonyi	1,634,166	1.45	67,506	3.38	120	1.94	12,635	2.19	2,563	4.21	6,906	6.67	15	1.47	
Rwensama	4,099,082	1.50	283,935	3.46	1,436	2000	67,800	2006	6,272	5.06	6,964	6.21	403	1.75	
Kayanji	742,488	1.42	35,938	3.38	543	2.11	10,968	2.10	2,255	4·91	4,441	6.34	441	1.70	
Kazinga	2,869,665	1.43	54,298	2.21	1,186	2.34	31,783	2.19	6,507	4.88	7,369	6.98	687	2.23	9,337.58
KAZINGA CHANNEL															
Both Landings atunguru)	391,116	1.41	44,151	3.78	684	2.00	26,425	2003	16,196	4.84	23,487	6012	25	1.80	444.51
LAKE GEORGE															
Kashaka	508,970	1.39	37,556	4.00	536	2.37	8,330	2.65	10,666	4.60	19,233	6.54	21	2005	
Muhyoro	402,502	1.41	22,579	3.57	66	2.12	2,191	2.03	4,919	4.37	13,552	6.73			
Kayinja	353,707	1.43	19,362	3.73	36	1.97	1,717	2.39	7,006	4.55	29,577	6.52	5	1.40	
Kashcnyi	316,823	1.39	72,097	3.95	3	2.00	733	2.08	8,287	4.05	16,956	6.55			
Hamukungi	649,873	1.39	6,752	3.80	91	2.05	245	2.26	9,063	4.44	3,804	6.76			
Kahendero	472,716	1.43	3,819	3.53	-	-	108	2.67	23,918	5.24	9,833	6.35	-	-	2,437.68
														GRAND TOTAL	12,719.77